The Liquidity Premium: A Theoretical *Potpourri*

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Complete markets

- If markets for contingent claims are *complete*, all assets are equally "liquid"
- There is no *liquidity premium*
- Asset prices are determined by *fundamentals*, independently of liquidity needs
- Equilibrium is *efficient* and portfolios are *indeterminate*
- Bankruptcy and default are unnecessary, because the allocation is *completely contingent*

Incomplete markets

- In practice markets are *incomplete* because of:
  - transaction costs;
  - moral hazard;
  - asymmetric information;
  - counterparty risk
- When markets are incomplete, firms face a *sequence budget constraints*
- Some assets earn a *liquidity premium*, because they can be used to meet financial commitments, i.e., satisfy budget constraints
- Although necessary in equilibrium, the liquidity premium can be distortionary, i.e., leads to investment in inefficient assets

Ex ante and ex post provision of liquidity

- With complete markets for contingent claims, liquidity provision is *ex ante* efficient
- When markets are incomplete, there are two alternatives for providing liquidity: (1) hold liquid assets (*non-contingent, ex ante provision*); (2) sell illiquid assets to obtain liquidity (*ex post provision*)
- In a crisis, liquidity tends to disappear, through market freezes, rationing, and fire sales
- The differences in modeling are largely a matter of taste (equilibrium vs disequilibrium), but the result is always default
- Even if fire sales/default are ex post efficient, they are generically ex ante *inefficient*, (imperfect insurance)

Why short-term funding markets are fragile

- The fallacy of composition: when everyone rushes for the exit at the same time, not everyone can get out
- The maturity rat race (Brunnermeier and Oehmke): competition to gain the benefits of liquidity can be self-defeating
- Neglected risks: rollover risk was ignored in the period prior to the crisis
- Overconfidence: even those who understood the risks (above) may have thought they would get an early signal to get out (the "greater fool" theory)
- The solution: Take the punch bowl away?

Liquidity regulation

- Allen and Gale (2004) consider an example of an economy with incomplete markets, no aggregate uncertainty and idiosyncratic liquidity shocks to financial intermediaries
- Interbank markets allow (some) risk sharing, but equilibrium is *constrained inefficient*
- There can be too *little* or too *much* liquidity, depending on whether the coefficient of relative risk aversion is greater or less than one
- In either case, a Central Bank can increase welfare by forcing intermediaries to hold more (or less) of the liquid asset depending on model parameters

Effect of the LCR

- Even in equilibrium with *too little* liquidity, however, the LCR *cannot* improve welfare
- The LCR requires each intermediary to hold enough of the liquid asset to cover the maximum withdrawals in the second period, so the total holdings are greater than total withdrawals in all states
- Some intermediaries must hold the short asset between date 1 and date 2, which implies that returns on long and short assets are equalized, i.e., $P = R$
- The interbank market is shut down, i.e., equilibrium is autarkic

A market solution

- Since the interbank market is active under laisser faire, welfare must be worse under autarky, i.e., under the LCR
- A partial solution is to let depositors hold a mix of short- and long-term claims (i.e., *deposits* and *bonds*) and trade long-term claims (bonds) at intermediate date
- In that case, the liquid asset is equal to early consumption (i.e., the first best is feasible) and the LCR is satisfied . . .
- . . . But, in equilibrium, the bank does no better than the incomplete market solution, i.e., there is no insurance against liquidity shocks (Kohn, 1983; Jacklin, 1986; Allen-Gale, 2004)

Optimal liquidity

- Consider a three-period model in which long-term assets are modeled as *reversible* investments
- "Banks" have access to long-term investments with different levels of "liquidity" (reversibility)
- "Speculators" have a first-period endowment and random, second-period investment options
- Speculators deposit endowments in the banks, planning to invest in outside options in the intermediate period
- A central planner chooses the allocation subject to incentive constraints (speculators private information about their options)
- The optimal portfolio matches the liquidity composition of the bank's assets to the state-contingent demand for liquidity
- The efficient allocation is supported by state contingent interest rates . . .

Fire sales and underinvestment

- Fire sales result from financially constrained asset markets (Bebchuk; Hart and Moore) and the perceived costs of fire sales can distort investment decisions
- E.g., Gale and Gottardi show that firms use too little debt because of fear of fire sales
- Introducing liquid assets reduces the severity of fire sales but also reduces investment and welfare: arbitrageurs holding liquid assets reduce the perceived cost of default, but also capture capital gains, reducing returns on investment is risky firms
- Even in a constrained inefficient equilibrium, greater investment in liquid assets can make everyone worse off

The liquidity premium and overinvestment

- *Bank liabilities are not equivalent to corporate debt* (pace Admati-Hellwig) . . .
- . . . because they provide liquidity services (earn a liquidity premium)
- Hence, capital is "expensive" relative to other forms of bank funding
- What effect does the liquidity premium have on investment?
- In a model with incomplete markets, fire sales, and a liquidity premium on deposits, *banks will overinvest*
- Deposits are too cheap a source of funding, i.e., does not reflect the true resource cost of investment

Conclusion

- These are "toy models" and shouldn't be taken too seriously; but the absence of theory underlying the LCR is worrying
- In general equilibrium, creating liquid assets or forcing banks to hold more liquidity can have surprising and unfortuate effects
- A LOLR will always be needed and trying to avoid the LOLR role may make things worse
- A better approach would be to encourage design of more robust institutions (and the shadow banking system)